**Intro to the Scientific Method**

**Why?**

Science is concerned with developing an increasingly accurate understanding of the world around us using observation and reasoning. There is no single way of doing science, but scientific investigations often involve the testing of alternative explanations through carefully designed experiments. Biology—like all science—is an ongoing process, with new ideas appearing and refining our understanding of the natural world.

1. Match the scientific method steps with the process of solving an everyday problem (lettered items).

\_\_\_\_Observation a. There is something wrong with the electrical outlet.

\_\_\_\_Question b. My toaster doesn’t toast my bread.

\_\_\_\_Hypothesis c. I plug my coffee maker into the outlet.

\_\_\_\_Prediction d. My coffeemaker works.

\_\_\_\_ Experiment e. Why doesn’t my toaster work?

\_\_\_\_Result f. If something is wrong with the outlet, my coffeemaker also won’t work when plugged into it.

1. Based on the results of the experiment, is your hypothesis supported? If it is rejected, propose two alternative hypotheses.
2. A **hypothesis** is a general principle or explanation that is derived from observations. A hypothesis is a tentative explanation – an idea that may or may not be true.

Suppose you make the following observations:
    a. You look at 10 human liver cells and observe that each one has a nucleus.
    b. You look at 10 onion cells and observe that each one has a nucleus.
    c. You look at 10 nerve cells from a mouse and observe that each one has a nucleus.

Label each of the following as an: OBSERVATION, VALID HYPOTHESIS, INVALID HYPOTHESIS, or a PREDICTION. Make a note on WHY you decided on that choice.

1. All cells have a nucleus.

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1. All onion cells have a nucleus.

3. The onion cells I looked at have a nucleus.

4. Only onion cells have a nucleus.

5. If I look at 10 skin cells from my hand, each one will have a nucleus.